

ABSTRACTS
*** Author Presenting Paper**

12 Poultry breeding: structure, traits, realized responses, and the future. M. T. Kuhn*, *Hy-Line International*.

In contrast to large animal livestock species, commercial egg producers purchase all female replacements for their flocks. These replacements are purchased from layer breeding companies such as Hy-Line International. To remain competitive, breeding companies must constantly improve their existing varieties as well as test and develop potential new varieties. Commercial varieties are produced from a 4-way cross of pure lines. Improvement in commercials is brought about by selection on the pure lines. At Hy-Line, there are two sources of data used for selection. One is records on pure line, fully pedigreed females housed at a central location called the research farm. The research farm, however, represents a specialized environment, having single bird cages and much tighter biosecurity than commercial operations. Because of potential GxE interaction, then, a second source of data is on commercial-type birds, identified by sire, which are housed in actual commercial operations. Primary traits under selection include egg production, egg weight, albumen height, shell color, shell strength, feed efficiency, sexual maturity, body weight, temperament, livability, and resistance to Marek's disease. Most of these traits are measured at both the research farm and in the (commercial) field test. Even for lines which have been closed and under selection for over 40 years, response to selection and heritabilities greater than zero are still being observed for all traits. The two most notable future directions will probably be changes in the market and implementation of marker-assisted selection. Some possible market changes include consumer demand for particular egg solid contents; e.g., lipid or cholesterol content, yolk weight, total egg solids. Demand for a bird which performs well on the floor or under free range conditions will also likely increase in the future. Hy-Line has its own molecular biology lab and is currently searching for markers associated with traits of interest. Utilization of marker information will likely include both introgression to form new pure lines as well as markers for within line selection.

Key Words: Poultry Breeding, Breeding Program, Realized Response